# Wulfsberg Electronics



## Flexcomm™ II
## Digital Control Head
### Controlling an
## Analog RT-5000

Created By: Heath Flor

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# Section I

# Required Components

# System Manuals
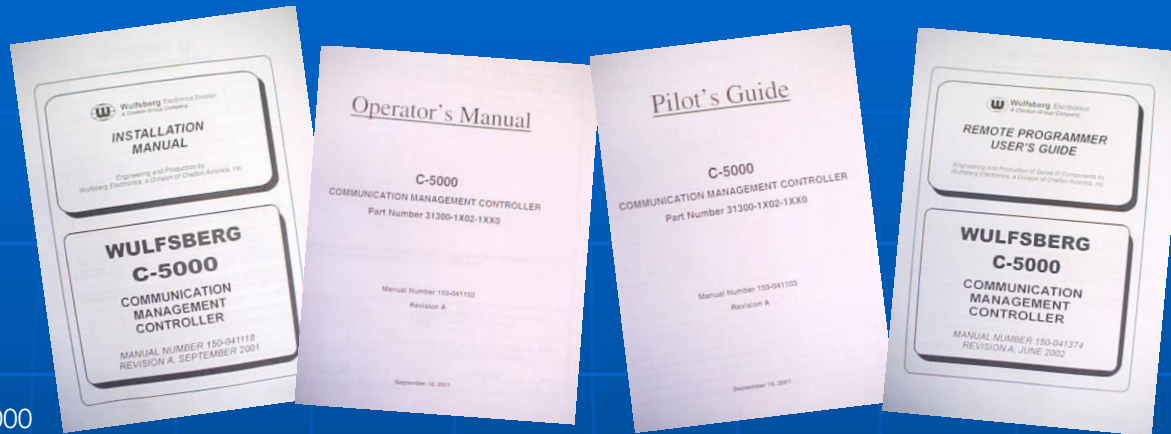
C-5000
System Installation Manual
PN 150-041118

C-5000
Operator's Manual
PN 150-041102

C-5000
Pilot's Guide
PN 150-041103

RpWin
Software User's Guide
PN 150-041374

These manuals are downloadable at:

## www.Wulfsberg.com
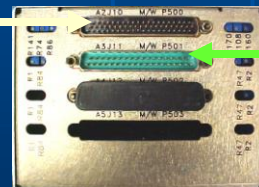
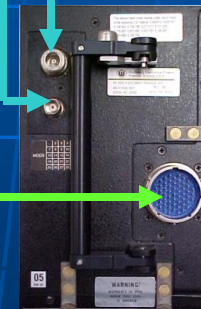# Primary System Components

Multi-band Antenna

Pilot Headset

Front
View

C-5000

Rear
View

RT-5000
-0X01

# Cloning Software & Cables

## Wulfsberg

Wulfsberg **RpWin**
Remote Programmer
Software
PN  404-041382

Wulfsberg
Remote Programmer
**Cloning Cable**
PN  246-042755

**Wulfsberg Clone Kit**
includes:
Remote Programmer
Cable & RP Software
PN  149-041389

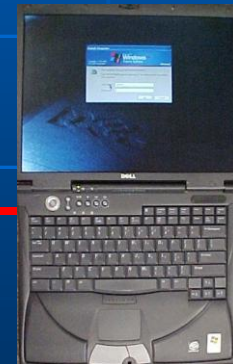# Cable Connections
# for RpWin Programming

RT-5000
-0X01



System Interface Harness
(power, ground, audio lines, etc.)

C-5000

Radio Harness

Computer

Loaded with Windows-based:
Wulfsberg RpWin software

RP Cloning Cable

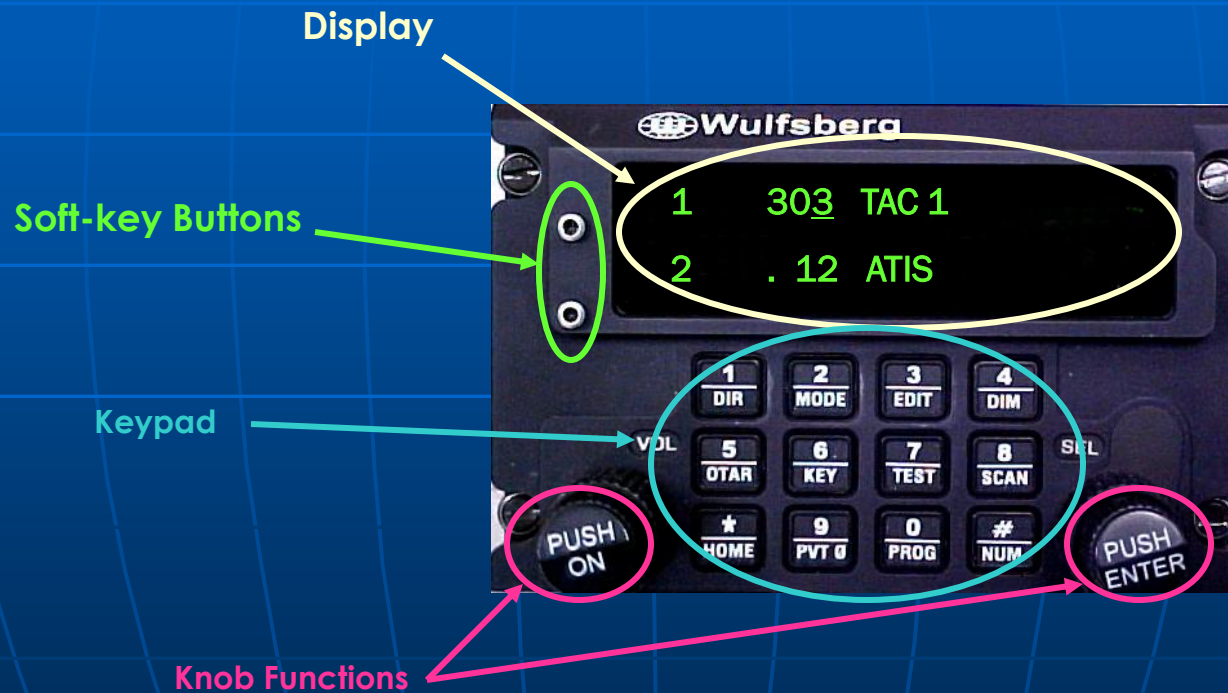**TIP:** If your computer does not have a serial port, you may require a USB~Serial Adapter

# Section II

# C-5000
# Basic Operations

# Basic Operation



C-5000 with Simplified User Interface

Display

Soft-key Buttons

Keypad

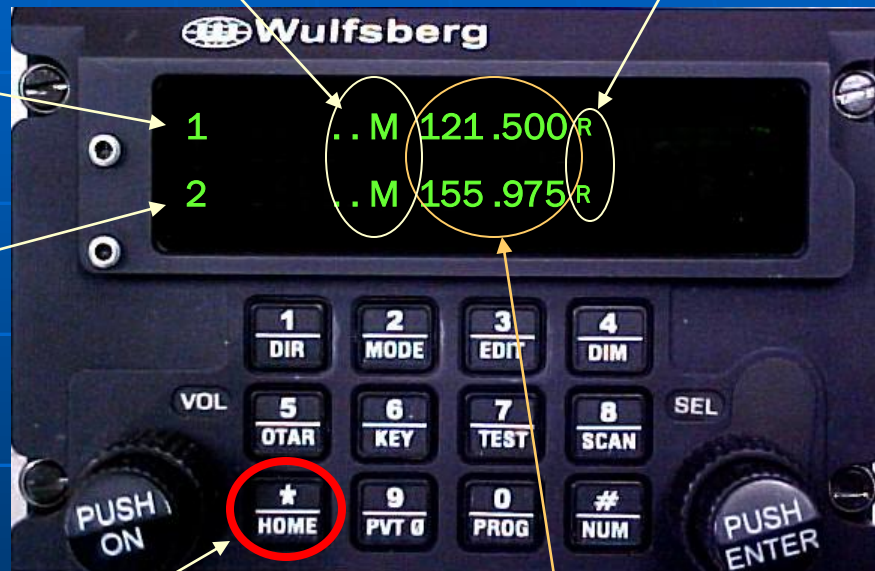Knob Functions

# The HOME Page & Display Description

**M** = Manual Channel

**R** = Receive

**Line 1** – always displays data for radio **System #1** (Primary Mic).

**Line 2** – always displays data for radio **System #2** (Secondary Mic).

Note: If no #2 radio is installed, this line will be blank.

To return to this page at any time . . . Press the **HOME** key.

This space will display the preset channel Alpha ID (Channel Names)
**OR**
the Manual Channel frequencies.

# Receive & Transmit Indication



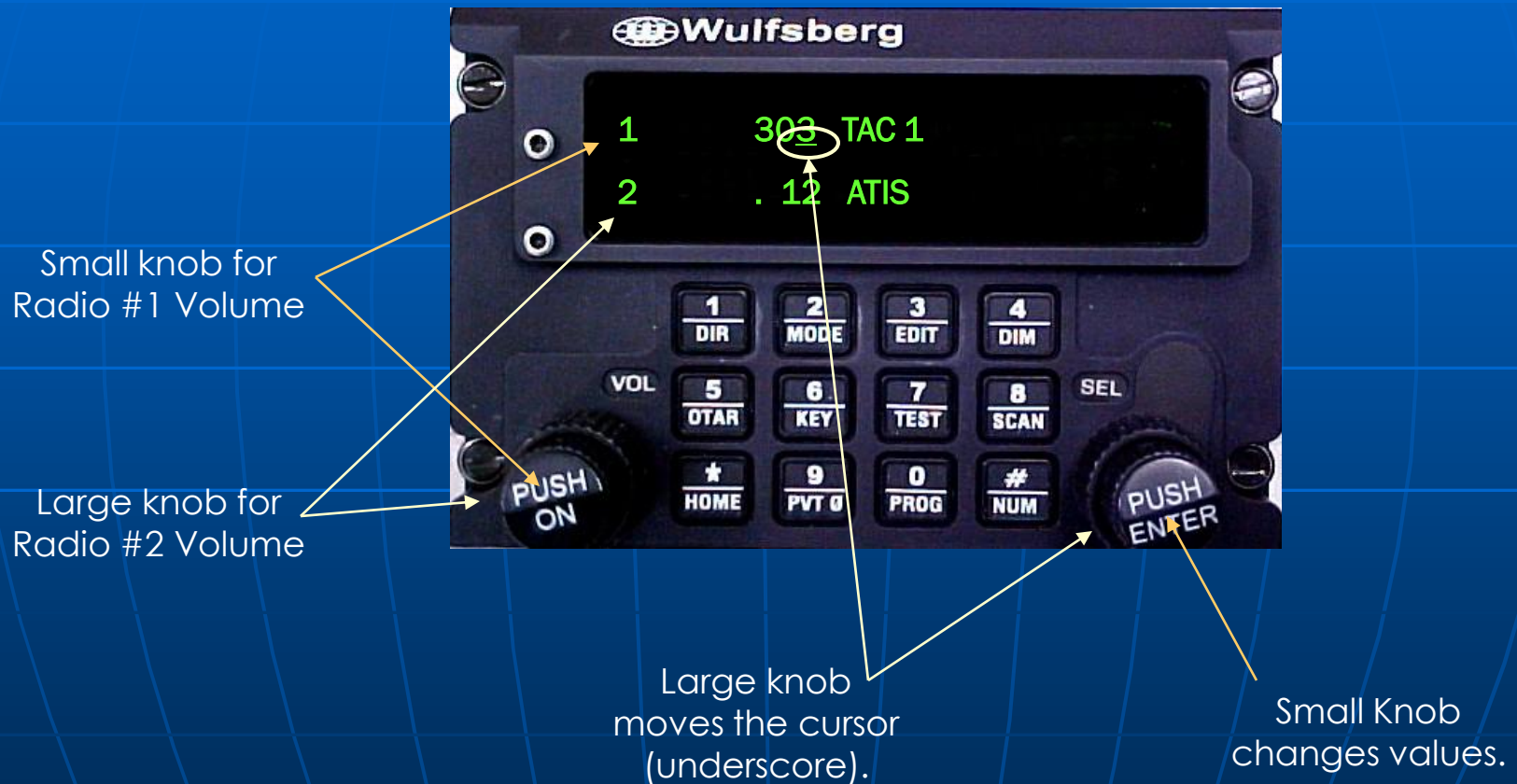Active Rx indicator shown on System 1 (reverse video).

Active Tx indicator (pointer) shown on System 2.

T = Transmit

Note: The Alpha ID is replaced by the Transmit frequency during transmit.

# Knob Functions



Small knob for Radio #1 Volume

Large knob for Radio #2 Volume

Large knob moves the cursor (underscore).

Small Knob changes values.

# Soft Key Buttons



The Soft Keys are only used when prompted. For example; display dimming.

# Keypad Functions

Toggle between Direct / Repeat Modes. Refer to Enhanced Mode training section.

Enhanced Modes access.

Opens EDIT page.

Display dimming.

Opens the "Test" squelch and display the Rx frequency.

Over-The-Air-Rekey

Alter the Tx encryption key for multi-key ops only.

The Scan key is not used at this time.

HOME page

Private transmit (∅) toggle switch (for compatible radios only).

Access programming, configuration, and key-loading options.

Channel # entry.

# The DIR Button in Repeater Mode
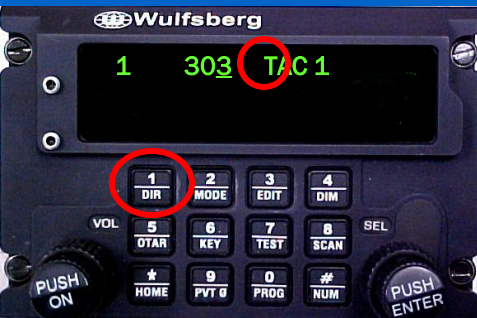


**155.000 MHz Rx**
**150.000 MHz Tx**

**Repeater Tower**

**Channel 92**
150.000 MHz Rx
**155.000 MHz Tx**

**Air Support**

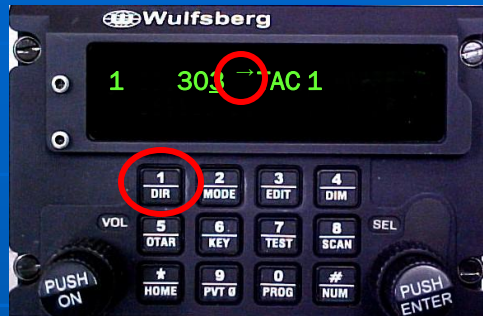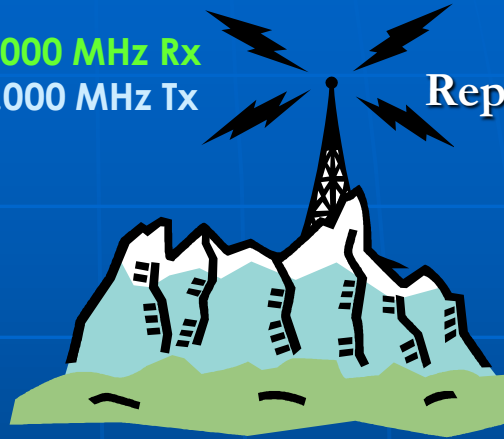**Channel 92**
**150.000 MHz Rx**
155.000 MHz Tx

**Ground Support**

# The DIR Button in Direct Mode

**155.000 MHz Rx**
150.000 MHz Tx    **Repeater Tower**

**Channel 92**
**150.000 MHz Rx**
~~155.000 MHz Tx~~
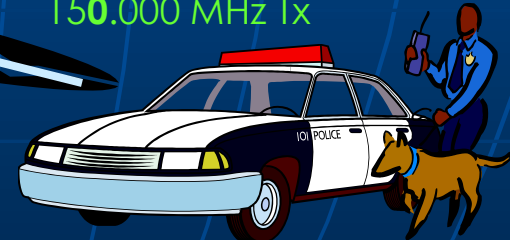15**0**.000 MHz Tx

**Air Support**

**Channel 92**
**150.000 MHz Rx**
~~155.000 MHz Tx~~
15**0**.000 MHz Tx

**Ground Support**

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# The DIM Button



Dim for nighttime & NVG display . . .

OR

Brighten for daytime use.

# The OTAR Button



NOTE:  This feature is not available on analog RT-5000's        -0X01

# The KEY Button
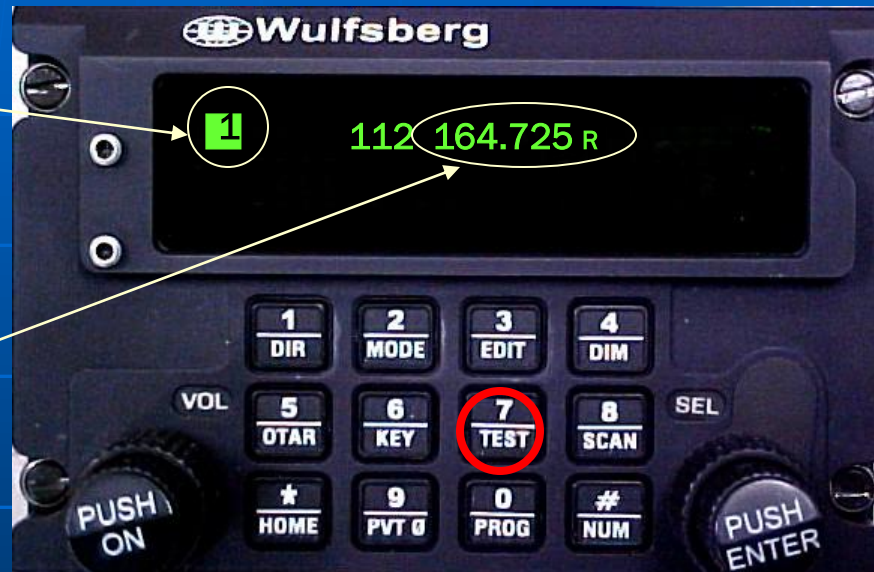# for multi-key encryption



NOTE:  This feature is not available
on analog RT-5000's       -0X01

# The TEST Button



Pressing the **TEST** button will force the squelch open showing a receive indication . . .

. . . and will display the channel Rx frequency.

**TIP:** This feature is useful for setting your volume levels and for verifying that your radio receiver is working.

**TIP:** The TEST button also has the affect of bypassing the sub-audible tones while being depressed.
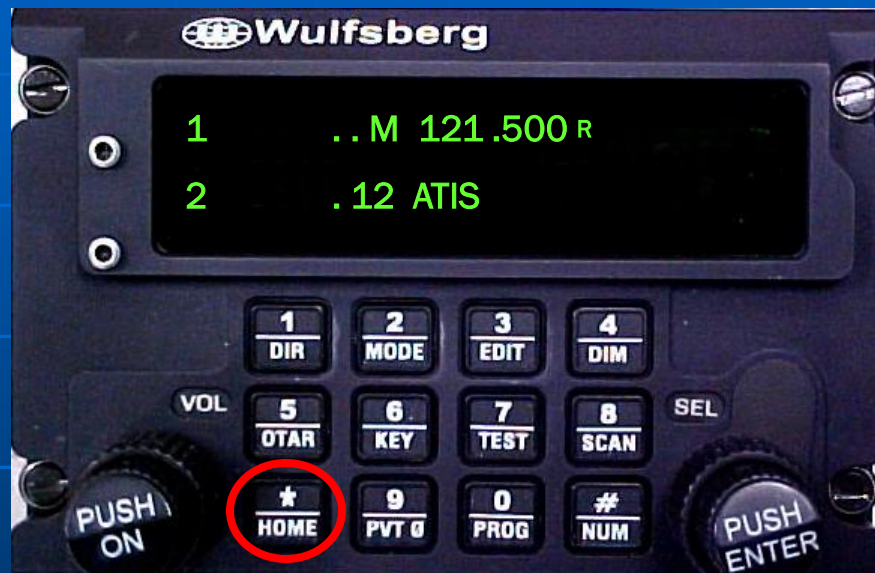
# The SCAN Button



NOTE: SCAN is not currently available.

# The HOME Button

**HOME** = Escape / Clear

To return to the Home page at any time . . . Press the **HOME** key.

# The PVT Button



This channel has not been defined as a private channel, so the PVT key will have no effect.

NOTE:  This feature is not available on analog RT-5000's        -0X01

# The PROG Button

The Program button opens
up the options for . . .



```
PROG:  2=NEXT   3=BACK
<ENTER>= CHANNELS
```

**Preset Channel Programming Mode**

This is an alternate method to RpWin for channel programming.

```
PROG:  2=NEXT   3=BACK
<ENTER>= SCAN GROUPS
```

**Scan Groups Programming Mode**

No scan options are currently available.

```
PROG:  2=NEXT    3=BACK
<ENTER>=  RP LOAD
```

**RP Software Cloning Mode**

This mode is for **Sending** RpWin data to a computer.

Note: No preparation is required for the C-5000 to receive data.

**TIP:** The program menu has an optional password barrier (Password 2), which may be turned off by entering <0000> into the hardware configuration. Factory default = <2222>.

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# The PROG Button Cont'd



```
PROG:  2=NEXT  3=BACK
<ENTER>=  CPS LOAD
```
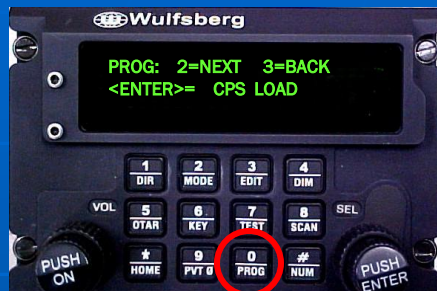
**CPS Software Cloning Mode**

This mode is used when **Reading or Writing** data to/from digital RT-5000's.

Note: This is not available on Analog RT-5000's.

```
PROG:  2=NEXT  3=BACK
<ENTER>=  KVL LOAD
```

**KVL Load Mode**

This mode is used when loading keys to a digital RT-5000.

Note: This is not available on Analog RT-5000's.

```
PROG:  2=NEXT  3=BACK
<ENTER>=  KEY ERASE
```

**Key Erase Mode**

Used to erase encryption keys in a digital RT-5000.

Note: This is not available on Analog RT-5000's.

```
PROG:  2=NEXT  3=BACK
<ENTER>=  CFG SYSTEM
```

**System Configuration Mode**

This is an alternate method to RpWin for hardware configuration.

Note: This is password protected and should only be accessed by selected individuals.

**TIP:** The configuration page has a higher level password barrier (Password 1). The factory default = <1111>.

# The NUM Button
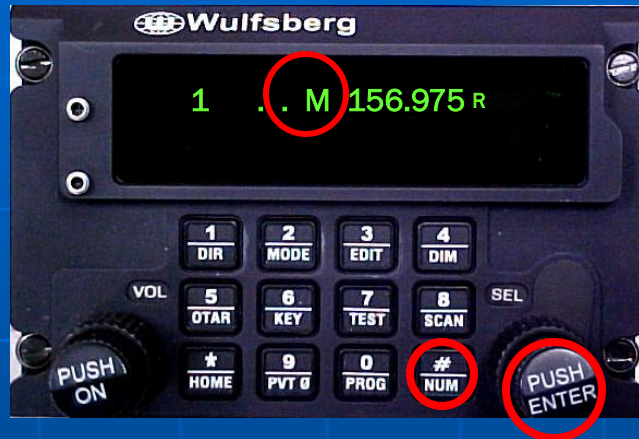


Pressing **# ENTER** will take you to the **Manual** (M) channel.



Or you may enter any <u>programmed</u> preset channel # and press ENTER.

# The EDIT Page
# for the Manual Channel

HOME Page
Manual Channel: M



Enter any MAIN
frequency 29.7 – 960 MHz

CTCSS (PL) or
DCS (DPL) tones

AM or FM
(analog only)

**N** = Narrow Band    (12.5 kHz)
**S** = Standard Band   (25.0 kHz)
**W** = Wide Band      (35.0 kHz)
**X** = Extra-wide Band  (70.0 kHz)

HI Power Output (nominal):
FM: 10 Watts
AM: 12 Watts

LO Power Output (nominal):
AM: 7.5 Watts
FM Lo Band: 1.0 Watts
FM Hi Band: 2.5 Watts
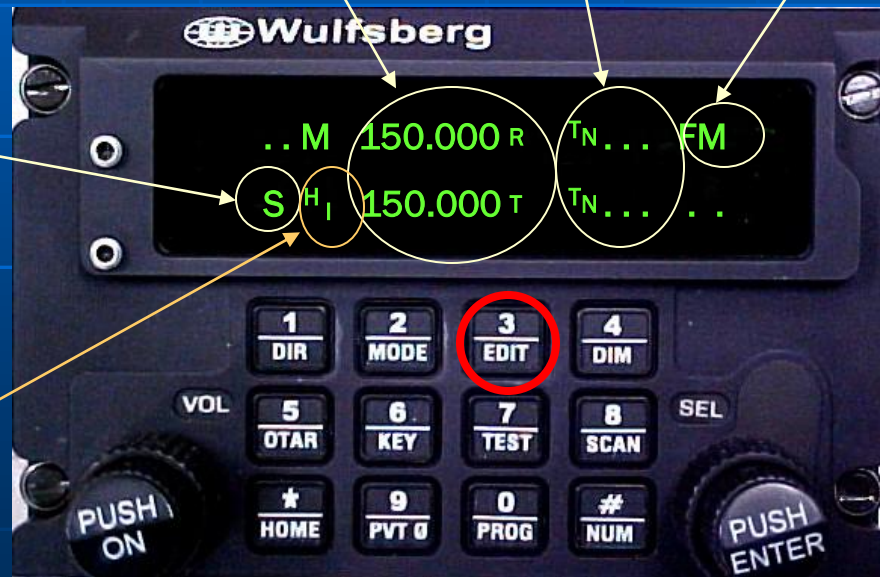


EDIT Page
Manual Channel: **M**

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# The EDIT Page
# for Main Preset Channels



HOME Page
Example: Channel 9

On **Main** preset channels, tones & power level may be altered.



EDIT Page
Channel 9

**TIP:** When the channel is changed, the Tones will revert back to the original value, but the power level will not revert.

# Section III
# Advanced Operating Modes

# Mode 1 vs. Mode 2



**Mode 1** lists all preset channels in numerical order.

Note: Analog RT-5000's P/N -0201 thru -0501 will automatically be in Mode 2 at all times.

**Mode 2** filters the Main channels on the left . . .

from the GUARD channels on the right.



Toggle between RT1 Main & GUARD with the soft-key.

A dual radio system with **Mode 2** display will look similar to this . . .

RT1 Main selected

RT2 GUARD selected

1 1 . 32 TAC 2
2 2 159 GUARD FM

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# Advanced Mode Operations



Phone Patch Mode



Relay Mode



Simulcast Mode



Repeater Mode

# Phone Patch Mode

DTMF    SELECT PHONE
PULSE    DIALING MODE

Required Equipment
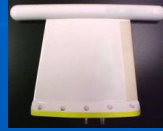
Hospital
(for example)
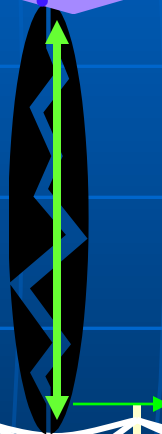
Phone Patch
Ground Equipment

# Relay Mode

RELAY MODE
1    101    2    312

Note:  This function requires
TWO RT-5000's

Required Equipment

# Simulcast Mode
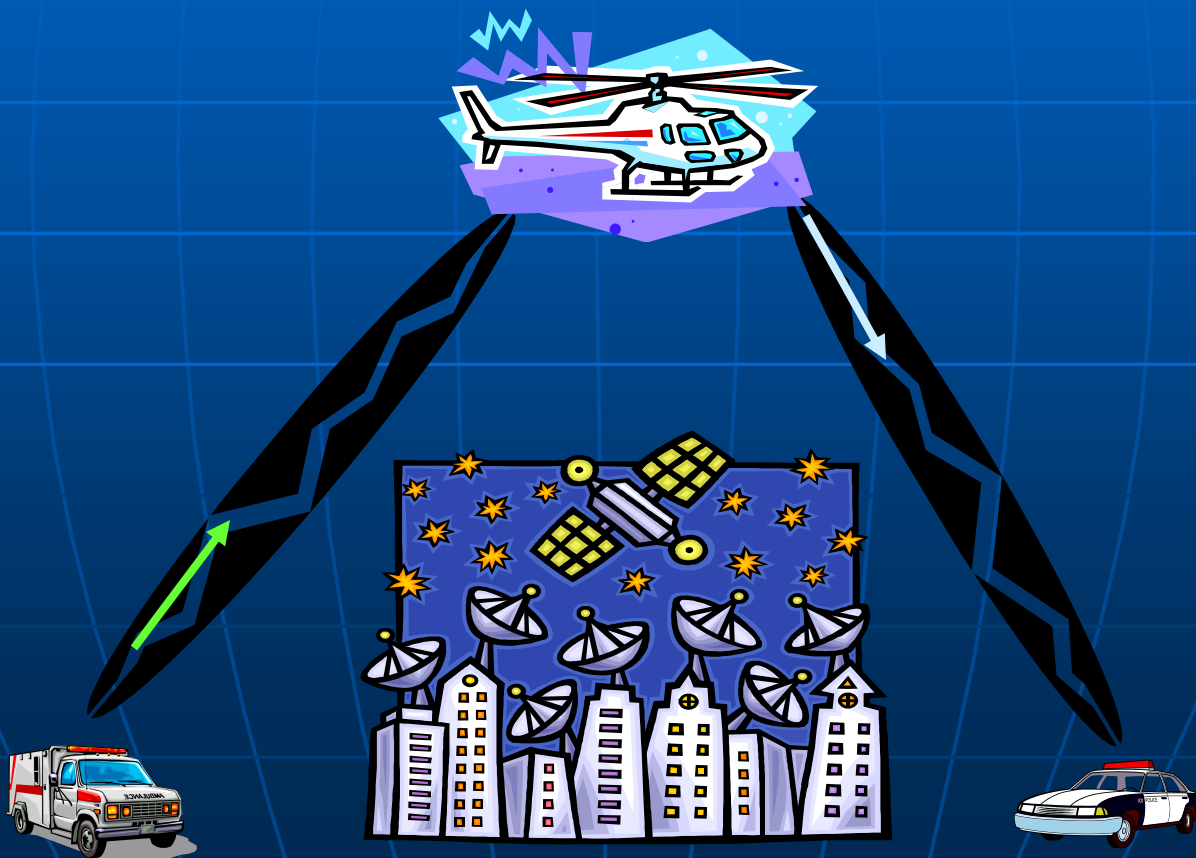
SIMULCAST MODE
1    101    2    212
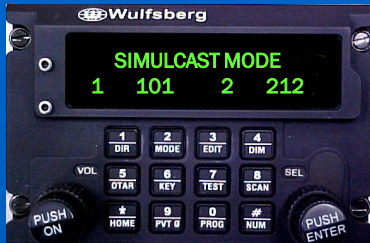
Note:  This function requires
TWO RT-5000's

Required Equipment

# Relay-Simulcast Mode

RELAY/SIMULCAST MODE
1   101   2   212

Note:  This function requires TWO RT-5000's

Required Equipment

# Airborne Repeater Mode



REPEATER MODE
1    159    2    RCV

Required Equipment

Note:  This function requires
TWO RT-5000's

HQ
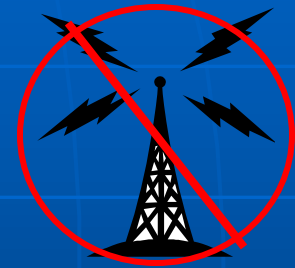
Group A

Group B

Example:
Repeater Tower
Not Functional

# Section IV

# C-5000 Programming

# Wulfsberg RpWin (Remote Programming Software)

for Windows™

# RpWin
# Loading the Software

RpWin  Remote Programmer Software (Windows compatible version)

Purpose

RpWin provides an efficient method of configuring hardware and loading frequency plans into the C-5000 Control Management Unit for single or multiple radios.

System Requirements

- Memory:                32 MB RAM minimum
- Operating System:  Windows 95/98/ME/NT/2000/XP
- Peripherals:           Microsoft Windows supported Serial Port

> NOTE: Windows VISTA currently not supported

Software Installation

1. Insert the Remote Programmer CD into the compact disc drive on your computer.
2. Access the CD Drive from Windows Explorer.
3. Run the installation program, SETUP.EXE.
4. Follow the instructions on the screen. (You may be prompted to re-boot your computer).

# RpWin
# Getting Starting



Select and open RpWin from the Windows Program List
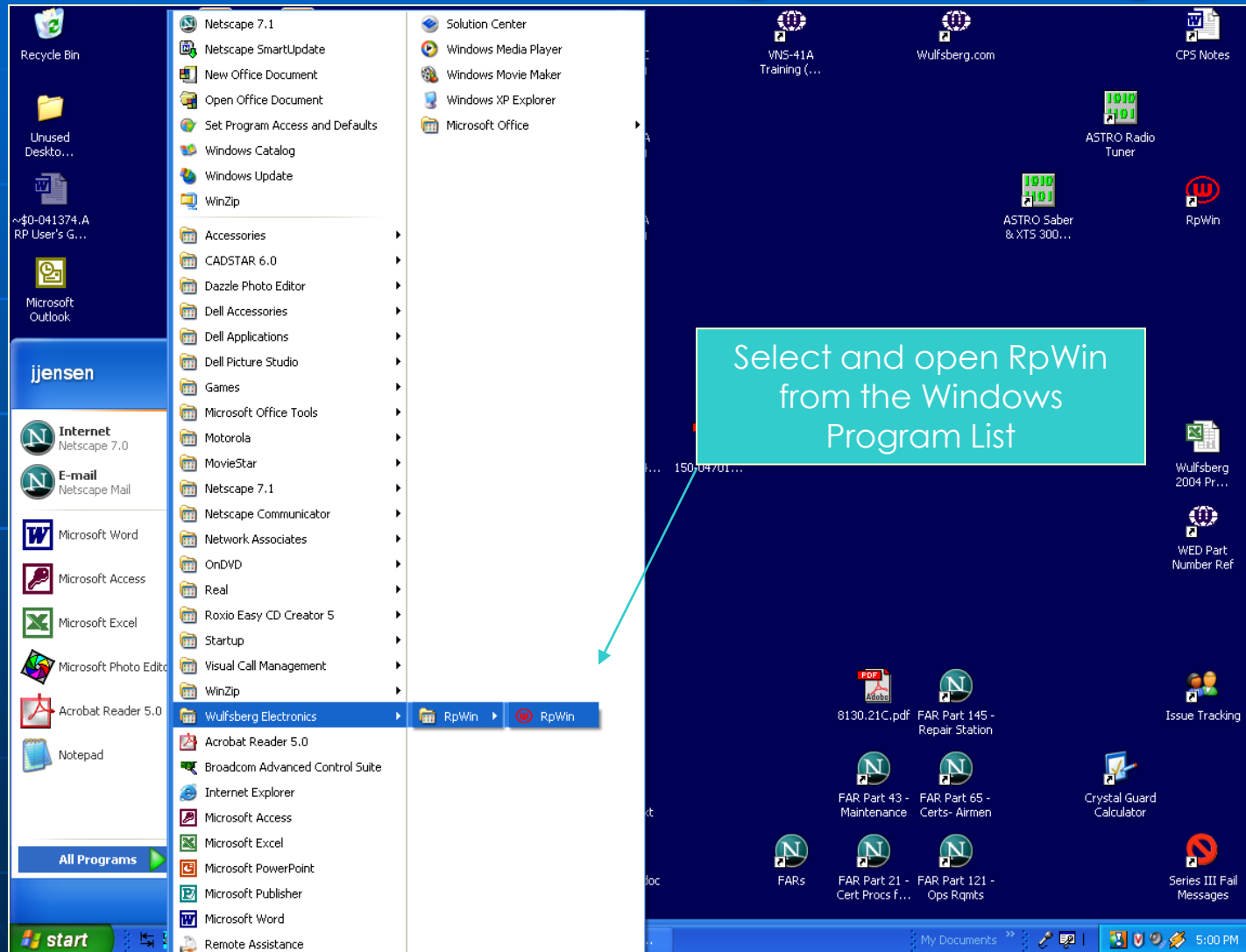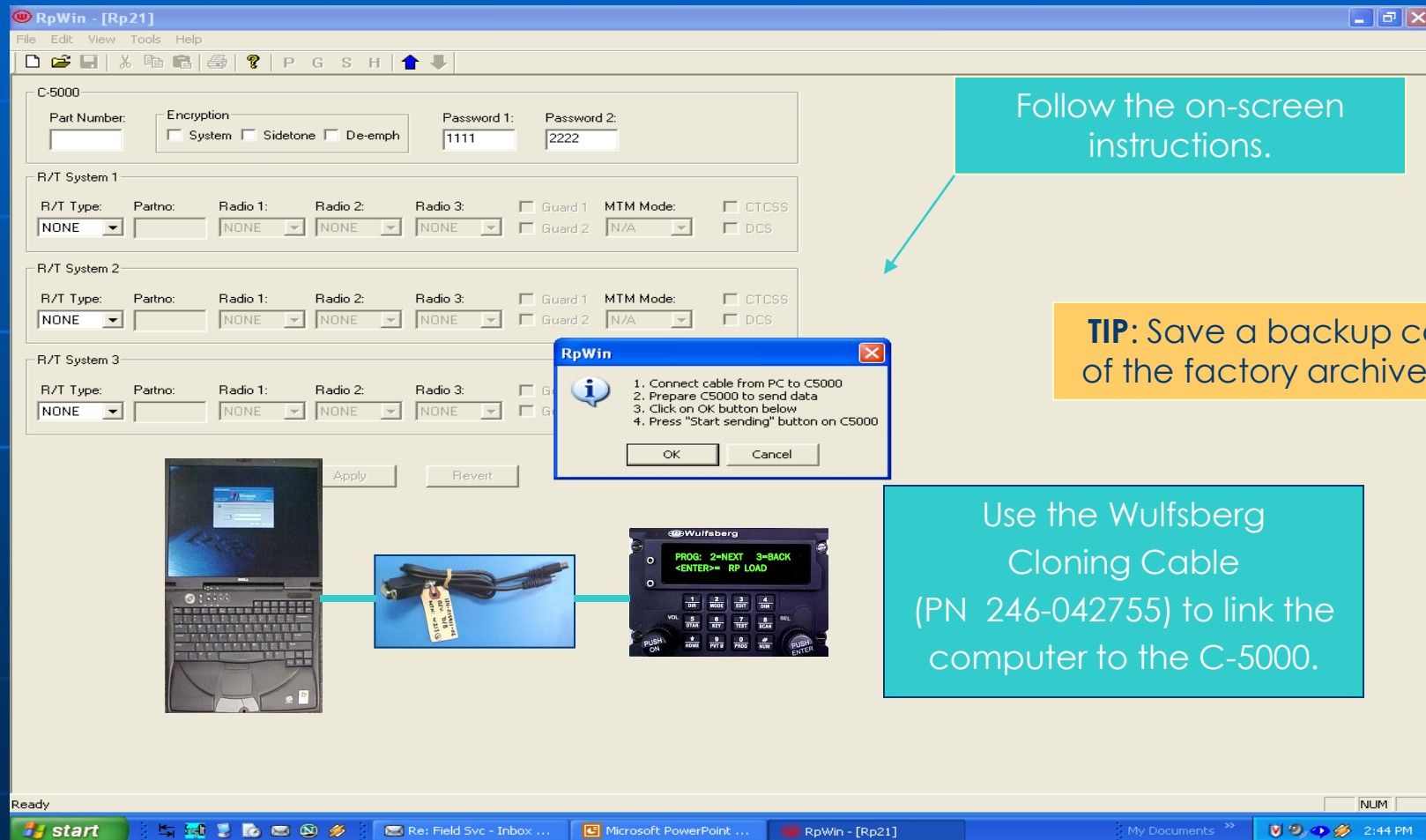
# RpWin
# Reading the C-5000 archive
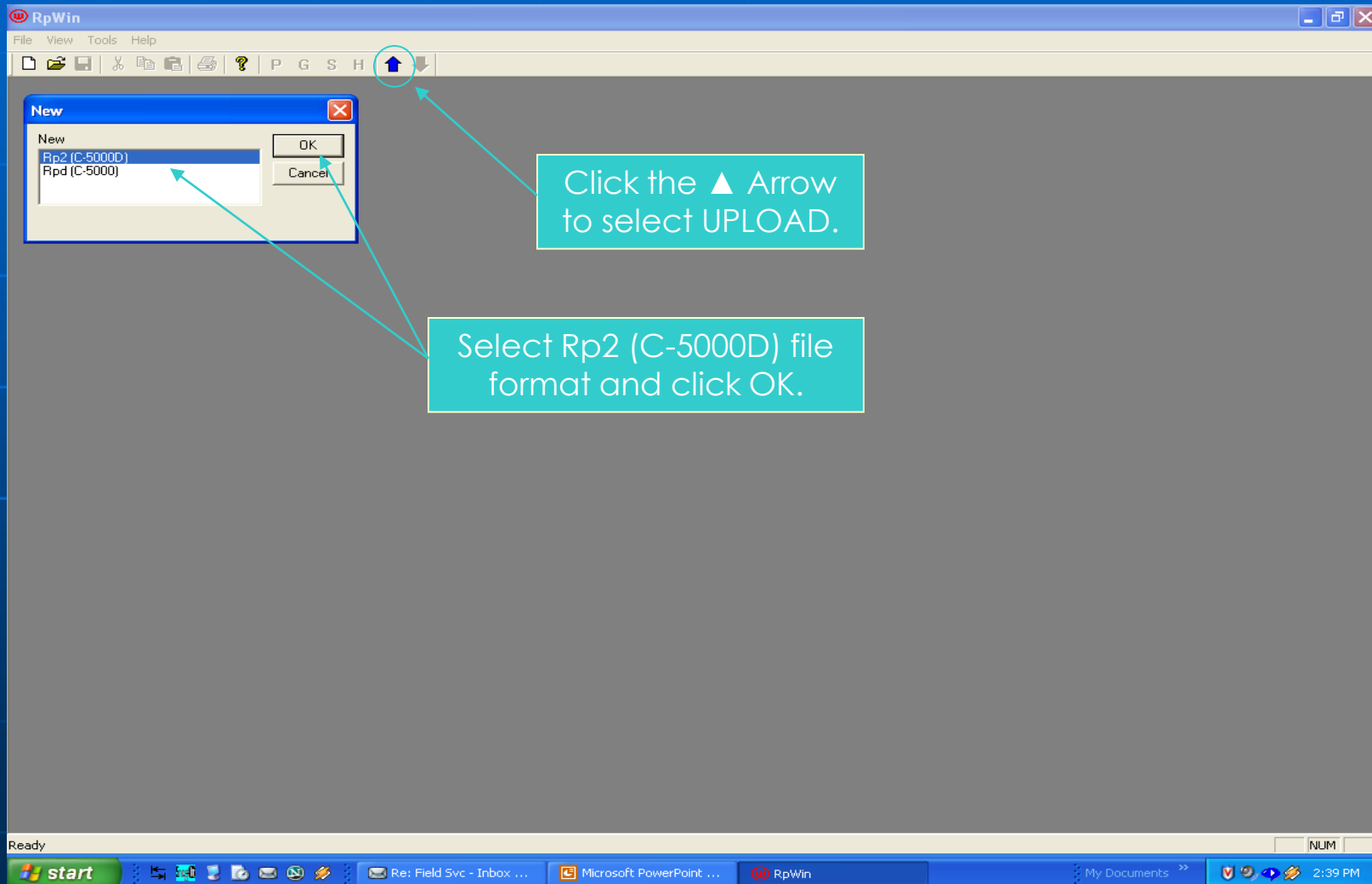
# RpWin
# Reading the C-5000 Archive Cont'd



Follow the on-screen instructions.

**TIP**: Save a backup copy of the factory archive file.

Use the Wulfsberg Cloning Cable (PN 246-042755) to link the computer to the C-5000.

# RpWin
# Reading the C-5000 Archive Cont'd



**ENTER PASSWORD 2**
**#= . . . .<ENTER>**

Enter the Level 2 Password

(Factory default = <2222>

**PROG:  2=NEXT   3=BACK**
**<ENTER>= RP  LOAD**

Select RP Load mode.

**MEMORY TRANSFER**
**START SENDING**

Press START to activate the upload function.

**MEMORY TRANSFER**
**SENDING BLOCK=000 . . . . .**

When complete, press HOME twice to return to the main screen.

# RpWin
# Hardware Configuration

# RpWin
# Preset Channel Setup

# RpWin
# Preset Channel Setup



RpWin - [Rp21]

File   Edit   View   Tools   Help
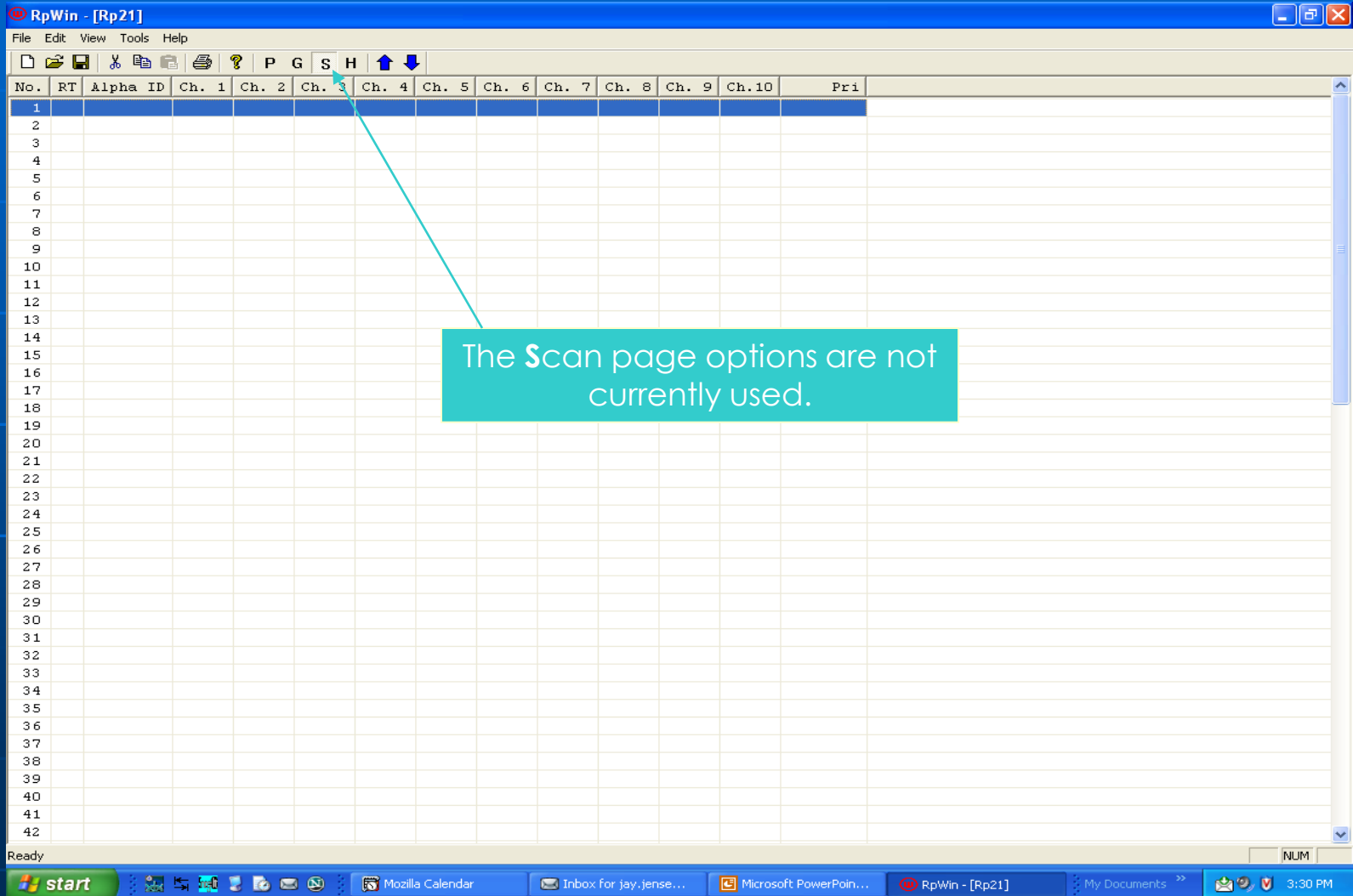
| No. | RT | Mod. | Alpha ID | Zone | Chan | RX Freq | RX Tone | TX Freq | TX Tone | TX Key | TX Pwr | RX Phase | TX Phase | Dev. | B.W. | Inj2 | Inj3 |
|-----|----|------|----------|------|------|---------|---------|---------|---------|--------|--------|----------|----------|------|------|------|------|
| 1 | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

Select the **P**resets page to define your preset channels.

We are about to create a new Preset channel for the Main transceiver portion of the RT-5000.

A typical frequency plan will have the following criteria:

| | |
|---|---|
| Preset Channel #: | 1 |
| Channel Name: | MAIN ANLG FM |
| Modulation: | FM or AM |
| Rx Frequency: | 150.000 MHz |
| Tx Frequency: | 150.000 MHz |
| Rx Sub-audible Tone: | None |
| Tx Sub-audible Tone: | None |
| Tx Power Output: | High |
| Bandwidth: | Standard |

Ready

start

9:35 AM

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# RpWin
# Preset Channel Setup Cont'd



You may define up to 350 user-defined channels.

Double-click on Chl 1 to open the Preset Channel Properties Box.

# RpWin
# Preset Channel Setup Cont'd



By default, assign all channels to radio system #1 for single RT-5000 installations.

The Alpha ID name you enter for each channel will appear on the C-5000 display.

NOTE: P-25 and TRK modulation does not apply to analog RT-5000's

Channels will be AM or FM only.

Enter the Receive frequencies, Transmit frequencies, etc.

# RpWin
# Preset Channel Setup Cont'd



Note: When finished, be sure to 'Apply' your data changes and save.

The Advanced box 'IF Inj.' and 'Phase' are normally unaltered from the default values.

# RpWin Guard Receiver Programming



The **G**uard page is used to setup the Guard Receiver preset channels for **RT-5000 PN flavors -0201 through -0501 only**.

# RpWin Scan Programming

The **S**can page options are not currently used.

# RpWin
# Download the C-5000 RpWin File



. . . Click the ▼ Arrow to select DOWNLOAD.

With your completed file open and ready to download . . .

Follow the on-screen instructions.

The C-5000 will reinitialize when Download is complete.

# Disclaimer

- The contents of this software is for training purposes only and should not be used to replace the installation, operations, or maintenance publications.

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